

## Unit 4 Practice Test Solutions

$$\begin{aligned}\textcircled{1} \text{ AROC} &= \frac{f(-2) - f(-4)}{-2 - (-4)} \\&= \frac{7(-2)^2 - 9(-2) - [7(-4)^2 - 9(-4)]}{2} \\&= \frac{28 + 18 - (112 + 36)}{2} \\&= \frac{-102}{2} \\&= -51\end{aligned}$$

$$\begin{aligned}\textcircled{2} \text{ IROC} &= \frac{f(x+h) - f(x)}{h} \\&= \frac{7(x+h)^2 - 9(x+h) - (7x^2 - 9x)}{h} \\&= \frac{7(x^2 + 2xh + h^2) - 9x - 9h - 7x^2 + 9x}{h} \\&= \frac{\cancel{7x^2} + 14xh + 7h^2 - \cancel{9x} - 9h - \cancel{7x^2} + \cancel{9x}}{h} \\&= \frac{\cancel{h}(14x + 7h - 9)}{\cancel{h}}\end{aligned}$$

Sub in  $x=6$   $h=0$

$$\begin{aligned}\text{IROC} &= 14(6) + 7(0) - 9 \\&= 84 - 9 \\&= 75\end{aligned}$$

$$\textcircled{3} N = 5000(1+t)$$

$$\frac{N(t+h) - N(t)}{h}$$

$$\frac{5000(1+t+h) - 5000(1+t)}{h}$$

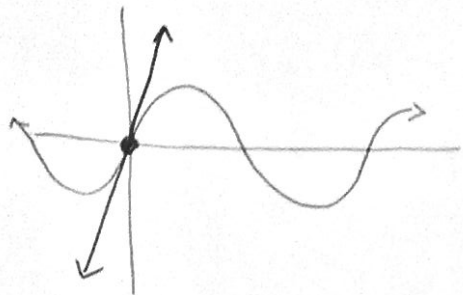
$$\frac{\cancel{5000} + \cancel{5000}t + 5000h - \cancel{5000} - \cancel{5000}t}{h} = \frac{5000h}{h}$$

$$5000$$

at  $t = 3$  years, population is  
 $\uparrow$  at 5000 ppl/year.

$\textcircled{4}$  must figure this one out!

1a)  $2x = \sin x$



Draw graphs accurately and find the points of intersections.

2a)  $f(h(x)) = -2x^2 - 13$

$$g(f(h(x))) = 9(-2x^2 - 13) - 7$$

$$= -18x^2 - 117 - 7$$

$$= -18x^2 - 124$$

$$D: \{x \in \mathbb{R}\}$$

$$R: \{y \in \mathbb{R}, y \leq -124\}$$

b)  $h(f(x)) = -2x^2 - 13$

$$D: \{x \in \mathbb{R}\}$$

$$R: \{y \in \mathbb{R}, y \leq -13\}$$

3)

$$f(x) + g(x) = (3, 11), (-3, 9)$$

$$\begin{aligned} f(5) - g(7) &= 8 - 9 \\ &= -1 \end{aligned}$$

$$f(x) \cdot g(x) = (3, 28), (-3, 0)$$

$$\begin{aligned} f^{-1}(12) + g(-3) &= 7 + 0 \\ &= 7 \end{aligned}$$